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31 August 1956

CMCC Doc. No. 151X5.232

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Dear Dick:

We are forwarding herewith seven copies of Progress Report No. 13, covering the work performed on System No. 3 during the period extending from 4 July 1956 to 4 August 1956.

Sincerely,

Burt

Burt

Enclosures:

CMCC Doc. No. 163X5.9

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CH 177

Monthly Progress Letter No. 13

Contract No. A-101

System 3

4 July 1956 to 4 August 1956

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1-0. GENERAL.

1-1. During the interval covered by this report, flight testing of the prototype system in the operational aircraft was completed and production of the first two systems to be delivered neared completion. In addition, work on the modified version of System 3 (known as 3A) was started.

2-0. SYSTEM DEVELOPMENT.

2-1. The development work associated with System 3 is almost completed and a final version of the r-f head assemblies has been constructed. These assemblies include decoupling filters to reduce the spurious responses, and an improved transmission line which provides a smoother frequency response in the coupling between the various r-f heads. In addition, a number of minor electrical and mechanical changes were made.

2-2. The detailed design of the plug-in assembly used to convert System 3 to System 3A was completed and a breadboard model of the assembly was constructed. Operation proved satisfactory and a layout of the plug-in board for the prototype assembly was completed. The switch assembly, used to select second local-oscillator crystals, is being fabricated. The prototype model of System 3A is scheduled to be completed on 15 September 1956.

3-0. FLIGHT TEST.

3-1. The prototype model of System 3 was installed in the operational aircraft After making some mounting adjustments, and minor antenna changes, an initial ground check was made.

3-2. On 23 July 1956, a local flight lasting about 75 minutes was made. On 24 July 1956, a test mission was flown along a prearranged path whose axis was approximately parallel to the coastline of California. At the time of flight, the lock-on sensitivity of the

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receiver was about ten microvolts. The lock-on duration was adjusted to about 20 seconds. In general, all three channels of the magnetic tape indicated that signals were received and recorded almost continuously. A survey of the recording is appended. This list is not complete, but does list the major portion of the signals recorded. Correlation between aircraft location and heading, and corresponding recorded data was made possible by a detailed flight plan. This plan is shown on the map overlay of figure 1, which shows also the various omnirange stations. Encircled letters on the overlay correspond to the encircled letters on the list of recorded signals of the appended survey.

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3-4. It is of interest to observe that direct feedthrough of the aircraft radio set occurred so that the pilot's voice was superimposed on the recorded data and, in some cases, the ground reply was also recorded. These superimposed recordings proved useful in making a more accurate correlation between aircraft position and recorded data. It is of further interest to note the following excerpts recorded from an unknown ground station, "Traffic at 1:00 o'clock. Range three miles southwest bound. Altitude is unknown -- It may be very high, making a very light target."

3-5. Antenna response to vertically polarized signals (omnirange stations) and to horizontally polarized signals (f-m stations) appears satisfactory. The recorded data indicates that antenna response is reasonably omnidirectional.

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4-0. TEST SET.

4-1. Construction of the first deliverable test set has been started and is about 50 percent complete. This first model is scheduled to be shipped on 12 September 1956.

5-0. PRODUCTION SYSTEM 3.

5-1. Production of the initial two systems to be delivered is nearing completion. These will be shipped on 15 August 1956. The production schedule of the following units has been established as follows:

<u>Shipment Date</u>	<u>Number of Systems</u>
15 August 1956	2
24 September 1956	3
15 October 1956	4
Thereafter	2 per week

6-0. SUMMARY AND PLANNING.

6-1. The results of the flight tests made in the operational vehicle are very promising. One more flight test should be conducted, however, to complete the evaluation of System 3 and to determine the degree of interaction which will occur between System 3 and the various other systems within the aircraft. This will be scheduled in the near future.

6-2. The principal effort during the coming month will center on two objectives; 1) completing the System 3A assembly, and 2) accelerating the production cycle.

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